

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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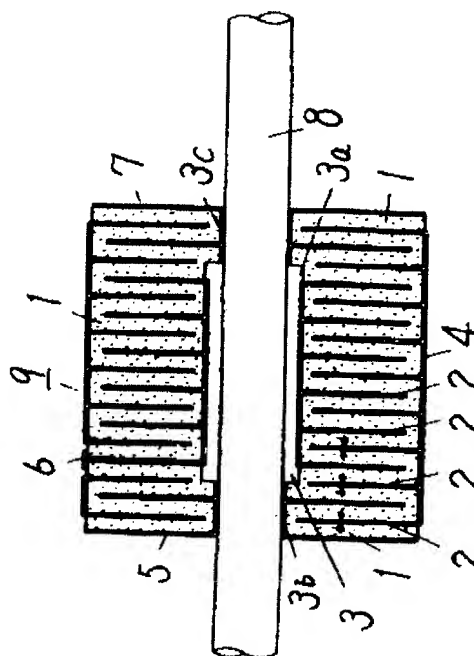
APPLICATION DATE : 19-09-83  
APPLICATION NUMBER : 58173447

APPLICANT : MATSUSHITA ELECTRIC IND CO LTD;

INVENTOR : KUSAKABE KENJI;

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TITLE : PIEZOELECTRIC TYPE ACTUATOR  
DEVICE



ABSTRACT : PURPOSE: To obtain a large displacement by a simple structure, wherein a plurality of disk shaped piezoelectric elements are alternately laminated through inner electrodes, a through hole is provided in the central part, at the central part the diameter of the hole is made larger than both end parts, and a rod is compressed into the hole.

CONSTITUTION: A mechanical displacement in a  $\mu\text{m}$  unit can be obtained by an electric signal. Piezoelectric elements 1 and electrodes 2 are alternately laminated, and an element 9 of a combined body is provided. A rod 8 is compressed into a through hole provided at the central part of the element 9. Voltages are independently applied to both end parts 3b and 3c and a central part 3a electrically through driving electrode terminals 5, 7, and 6. When the voltages are applied to the electrode terminals 5, 6, and 7, the left, center, and right are electrically expanded and contracted. When the rod 8 is fixed, the element 9 is moved. When the element 9 is fixed, the rod 8 is moved. The amount of displacement can be changed by the driving voltages and the number of driving pulses. By changing the sequence of the driving pulses, the direction of the displacement can be changed.

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